CIVIL AVIATION SITE SENSITIVITY VERIFICATION REPORT FOR THE DEVIATION OF THE 400KV PLUTO-MAHIKENG POWERLINE AND PROPOSED MAHIKENG SUB-STATION WITHIN JB MARKS LOCAL MUNICIPALITY UNDER THE DR. KENNETH KAUNDA DISTRICT MUNICIPALITY AND MAHIKENG LOCAL MUNICIPALITY WITHIN THE NGAKA MODIRI MOLEMA DISTRICT MUNICIPALITY, NORTH-WEST PROVINCE.

PREPARED FOR:

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1 Executive Summary

14km and 45m Deviations of the Proposed 400kV Transmission Line between the Pluto, Watershed and the proposed Mahikeng Substation, North-West Province.

Compliance with SA Civil Aviation Authority (SACAA) Regulations (SACARS)

The main findings of this Civil Aviation Site Sensitivity Verification Study (CASSV) are as follows:

- **Obstacles – Transmission Lines, Pylons and Substation Structures**

There are no aerodromes or significant ground-based aviation infrastructure affected by the proposed deviations, and the only airspace likely to be impacted is the Magalies-Orient Glider area, in respect of which an 'advisory' to aviators is applicable from Flight Level 110-145 (i.e., 11000ft above mean sea level to 14500ft amsl).

In practical terms the advisory area is 1808m above ground level for this location, which has no impact. There are thus no potential obstacle penetrations, and the proposed deviations are compliant with the SACARS. Environmental sensitivity on the civil aviation theme is considered low, while operational and safety risk is considered tolerable subject to mitigation.

As for the original transmission line corridor, SACARs compliance during the construction phase must be subject to ongoing liaison with the SACAA to finalise their marking and illumination requirements subject to submission of an Obstacle Approval Application, once environmental authorisation is granted.

- **Radar and Navigational Infrastructure**

The proposed deviations will not materially impact civil aviation radar, navigational, or communications infrastructure in the environs, nor present any material additional risk to aviation operations. No transmission line infrastructure is proposed within 500ft of any aviation-related infrastructure, the guideline recommended by the US FAA (Appendix 7.8), within which potential radio frequency (RF) interference could occur. Additionally, it is assumed that all new overhead powerlines will be located within approved corridors that comply with Eskom guidelines 240 –125383428 and 240-170000623 relating to powerline servitudes, none of which encroach close enough to any infrastructure to constitute a material risk to civil aviation operations. There are no ground-based DVOR/DME (see Appendix 7.1: Glossary of Terms) installations within 15km of the proposed deviation, and risk is assessed as low. Similarly, there are no NDBs (see Appendix 7.1: Glossary of Terms) within 15km of the proposed deviation, and risk is assessed as low.

- **Civil Aviation Routes: Radio and Communications Interference**

Other than the advisory notice concerning the Magalies-Orient Glider area, the proposed deviations will not affect any conventional or satellite-based (GNSS and RNAV: see Glossary in Appendix 7.1) routes or uncontrolled airspace in the area.

The guideline minimum distances prescribed by the US FAA for the siting of new facilities away from radar, navigational, and other communications devices they could potentially impact range from 250ft to 500ft (75 to 150m) (Appendix 7.8). These are well below the distance of the proposed deviations from any ground-based communications infrastructure and radio equipment, the closest of which is beyond 35km away, or overflying aircraft. Additionally, it is assumed that overhead powerline servitudes will comply with Eskom Guidelines 240 –125383428 and 240-170000623. The risk of RF interference is thus low.

Environmental Impacts

This CASSV finds that the environmental sensitivity of the deviations on the civil aviation theme is low, obviating the requirement for a Compliance Statement with comment from the SACAA. Once the EA is secure and development commences, SACAA requirements for the marking and illumination of specific infrastructure will need to be determined through an Obstacle Approval process in terms of the SACARS.

2 Introduction

2.1 Project Background

The proposed deviation is part of a 400kV transmission line of approximately 254km from a proposed new sub-station near Mahikeng, via the Watershed substation to the Pluto substation, near Roodepoort. The first deviation is 14km long, ending some 23.75km west of the Pluto substation (Figure 1), and the second is a minor re-alignment of approximately 45m close to Wondergat, near Mahikeng (see Figure 2).

The National Transmission Company South Africa (NTCSA) had previously identified the need for strengthening of the 275kV network including upgrades to 400kV and an additional corridor to evacuate new generation capacity in the region linking the North-West Province back into Gauteng, from Mahikeng. Environmental authorisation had been granted for the main section of the transmission line, and this study deals only with the 14km deviation described and 45m re-alignment.

The deviations are consequent to other environmental issues and are not expected to impact the sensitivity on the civil aviation theme., which was originally reflected in the DFFE Screening Tool as 'low'.

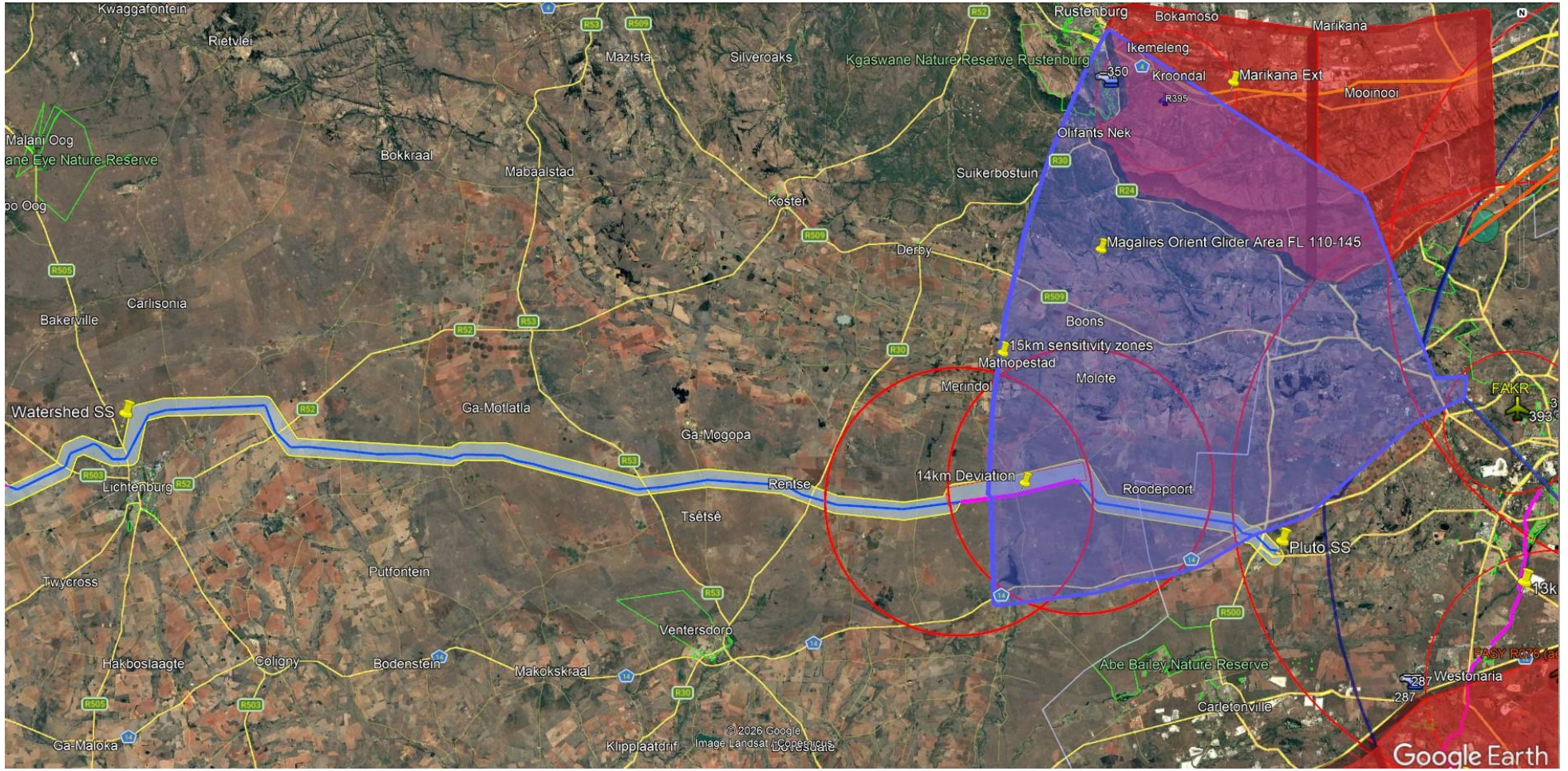


Figure 1: Transmission Line Route from Watershed to Pluto SS showing 14km Deviation

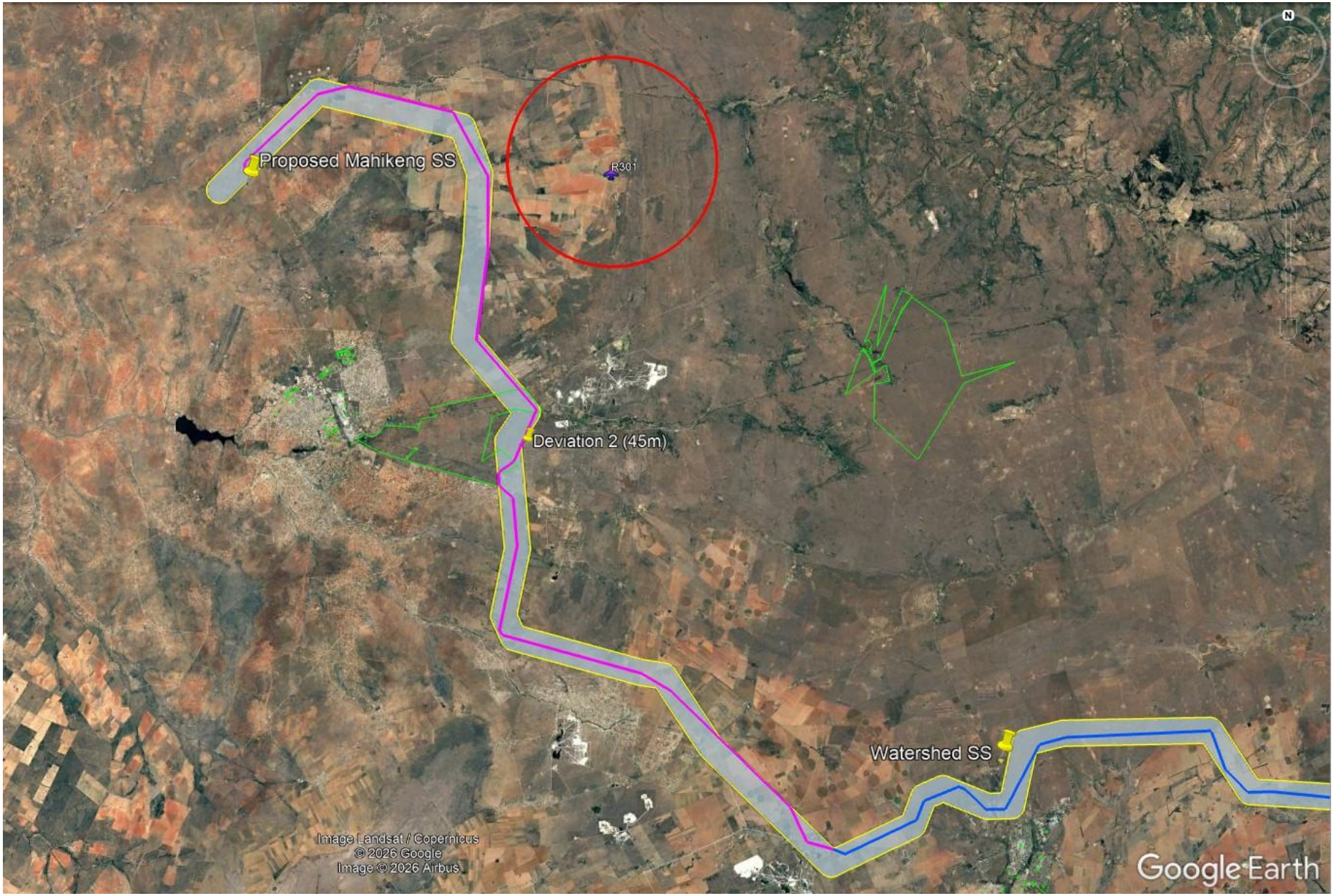


Figure 2: Deviation 2 of 45m near Wondergat

2.2 Environmental Regulatory Environment

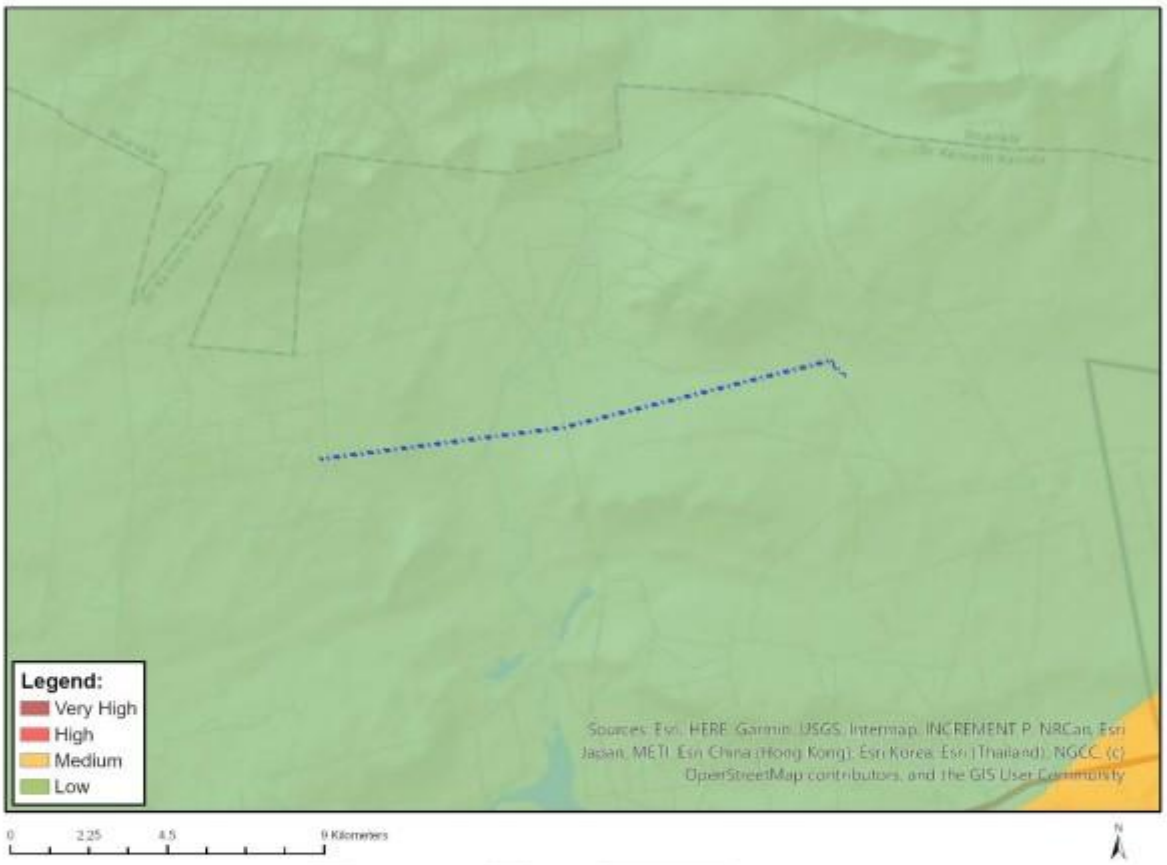
The DFFE requires information in terms of the EIA Regulations, 2014 as amended, for the Department to be able to process the Basic Assessment Report (BAR) for the deviated portions of the line. Insofar as the civil aviation theme is concerned this includes:

- Assessment of the proposed deviations.
- Analysing any impacts arising from the latest civil aviation regulatory provisions in the Civil Aviation Regulations (SACARS) and Technical Standards (SA-CATS).
- Assessing the impacts on new civil aviation infrastructure constructed in the interim period.
- Determining mitigation measures required.
- Risk Analysis.

In accordance with GN 320 and GN 1150 (as amended by GN 3717) of the NEMA EIA Regulations of 2014, specialist assessments are required pursuant to a new site sensitivity verification by the EAP, using the National Web-Based Environmental Screening Tool (Screening Tool).

For the proposed 14km and 45m deviations, the updated Screening Tool analysis by Vhubvo identified low sensitivity (Figure 3). Notwithstanding this output, GWI Aviation Advisory (GWI) were appointed to execute a Civil Aviation Site Sensitivity Verification study (CASSV). A CASSV is a high-level Aeronautical Study in accordance with standard SACAA guidelines (TGMs) for such studies. It also draws on precedent material from the United States Federal Aviation Administration (US FAA), the United Kingdom Civil Aviation Authority (UKCAA) and various other sources, including Eskom guidelines on required servitude widths within which powerlines are located, to mitigate the risk of electromagnetic and other impacts on adjoining property (Eskom Doc. 240-170000623 HD, which is a restricted document).

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

Figure 3: Screening Tool Output

2.3 Civil Aviation Regulatory Environment

While the DFFE is the Competent Authority (CA) tasked with regulating environmental, forestry and fisheries related matters, the SACAA regulates civil aviation safety and security. Thus, should a CASSV conclude that environmental sensitivity on the civil aviation theme is medium or higher, a Civil Aviation Compliance Statement prepared by the specialist may be required, after further consultation with the SACAA, based on the impact on affected civil aviation infrastructure.

In addition to CASSVs, the SACARS and SA-CATS require Aeronautical Studies for developments deemed to present safety and/or operational risks to nearby aerodromes or navigational infrastructure. SA-CATS 139.01.30, which was amended in March 2025 (SA-CATS2 of 2025) and Amendments 26 and 31 of the SACARS, in February 2025, impose on operators[1] of different types of aerodromes the obligation to mitigate risks that obstacles or other risk factors present to aerodrome or aircraft operations. Thus, after Environmental Authorisation for developments close to aerodromes or sensitive airspace has been granted and the project is construction ready, the SACAA generally requires a formal Obstacle Application to be submitted in accordance with the procedure outlined in document CA139-27, by a CAA-approved Obstacle Assessor.

Notes: 1. SACAA regulations distinguish between certified, licensed and approved aerodromes of various types – in the case of unlicensed or unapproved aerodromes the generally accepted interpretation is that the obligation becomes that of the aerodrome owner.

3 Deviation of the 400kV Transmission Line

3.1 Layout and General Description

The main project comprises a 400kV transmission line of approximately 254km from a proposed new sub-station near Mahikeng, via the Watershed substation, to the Pluto substation, near Roodepoort. The proposed 14km deviation ends 23.75km west of Watershed substation in the North-West Province, as it passes through rural farming areas, more than 15km from any aerodromes or other aviation infrastructure. The 45m deviation is approximately 46.8km from the proposed Mahikeng sub-station where the line is very close to the edge of the approved corridor and has thus been slightly re-aligned.

Possible civil aviation impacts on the ground or in adjoining airspace include those attributable to:

- substations,
- transmission lines themselves,
- underground cables and overhead high voltage power lines (400kV), and
- penetration of supporting pylons into obstacle limitation surfaces.

Figures 1 and 2 show the deviated sections of the proposed transmission line covered in this report, which routes from Mahikeng to the Watershed SS near Lichtenburg and from there to the Pluto SS, through the North-West Province into Gauteng. The Screening Tool indicates low sensitivity of the 14km and 45m deviated sections, as described.

4 Approach and Methodology

4.1 Assumptions and Limitations

While the scope of the study is to undertake the CASSV based on the requirements of the DFFE Protocol 320 of 2020, it also references various standards and recommended practices of the ICAO, the SACAA and other authorities, which impose various limitations and publish numerous Standards and Recommended practices, and National Airspace data, as applicable at the dates noted. These include:

- The Civil Aviation Act No. 13 of 2009
- Draft White Paper on Civil Aviation Policy, 2017
- ICAO Annex 14, Volume 1, 2018: Aerodrome Design and Operations (see Appendix 7.4 & 7.5)
- SA Civil Aviation Regulations (SACARS): Part 139 – Aerodromes and Heliports, February 2025
- SA Civil Aviation Technical Standards: SA-CATS 139.01.30 (up to 31st Amendment, February 2025)
- Obstacle Limitations and Markings Outside Aerodromes or Heliports (Appendix 7.2)
- Associated provisions of SA-CATS 139.02.2 – Aerodrome Design Requirements
- ATNS Database of civil aviation airspace in South Africa, February 2025.
- The SACAA Aeronautical Information Publication (AIP), July 2025 (Appendix 7.11).

4.2 Approach

The CASSV was conducted by GWI in terms of the DFFE Protocol but also applied SACAA guidelines including SACAA document "Technical Guidance Material (TGM) for conducting Aeronautical Studies or Risk Assessment" effective January 2022 (Appendix 7.3), noting recent amendments (in February 2025) to the Civil Aviation Regulations, which will affect the impact of the proposed deviations according to the SACAA status of any affected infrastructure. The study comprised the following elements:

- Initiation – Identification of potential impacts and risk issues.
- Technical analysis.
- Compliance assessment.

- Risk Assessment – Estimation, Evaluation and Control.
- Action and Monitoring, including Risk Mitigation (as required).

The study also incorporates various standards and recommended practices (SARPS) of ICAO and other authorities such as the US FAA.

4.3 Aspects of DFFE Protocol 320 of March 2020

A 'Protocol for the specialist assessment and minimum report content requirements for environmental impacts on civil aviation installations', was gazetted by the DFFE as GN No.320 in Government Gazette 43110 on 20th March 2020. The Protocol is attached as Appendix 7.6. In terms of the Protocol, the EAP is required to undertake an initial review of the project, utilizing the Screening Tool developed by the DFFE, to assess its potential impact on adjoining civil aviation installations. The Screening Tool uses distance as an indicator of sensitivity. If the site is:

1. *Between 15 and 35km from a civil aviation radar, or*
2. *Between 15 and 35km from a major civil aviation aerodrome, or*
3. *Between 8 and 15km of other civil aviation aerodromes*

then a sensitivity rating of medium or high is assigned, which triggers a CASSV. In terms of the Protocol:

- *If the outcome of (the Specialist's) site sensitivity verification justifies a sensitivity of medium or higher, then a Civil Aviation Compliance Statement is required.*
- *If the outcome of (the Specialist's) site sensitivity verification indicates low sensitivity, then there are no further requirements.*

4.4 Resources Deployed

The qualifications, credentials and requisite experience of GWI and the CVs of resources deployed on the study are attached to this report as Appendix 7.7. GWI has undertaken nearly 50 such CASSVs since 2022 and is familiar with the regulatory processes and procedures involved.

4.5 Technical Assessment Elements

The CASSV comprised the following elements:

4.5.1 High Level Obstacle Assessment

Using ICAO Annex 14 and the relevant SACARS/SA-CATS standards, relevant Obstacle Limitation Surfaces (OLSs) of any affected aerodromes were reviewed and the risk assessed that the proposed deviated

transmission line and associated infrastructure might present to these surfaces.

4.5.2 Airspace Analysis

While the Screening Tool returned low sensitivity, the SACAA Aerodrome Directory, the Aeronautical Information Publication (AIP) and the Air Traffic and Navigational Services Corporation (ATNS) database information was nonetheless overlaid on available topographical data of the proposed route, and risk assessed of the potential impact of the project on aircraft operating in the area, both in controlled airspace under Instrument Flight Rules (IFR) and in uncontrolled airspace under VFR (Visual Flight Rules) according to various Rules of the Air contained in the SACARS (Mainly Part 91).

4.5.3 Radar, Navigation and RF Interference Assessment

Using information available from the SACAA and ATNS, the location of civil aviation radar and other navigational equipment and infrastructure within the guideline distances (usually between 250ft and 500ft, per the US FAA) from the proposed deviated transmission line were determined and the risk assessed of the impact on the operation of these installations, also referencing relevant Eskom standards for RF/Electromagnetic (EM) impacts of powerlines on infrastructure located close to them.

5 Analysis and Outcomes

5.1 Obstacle Limitation Surfaces

ICAO requires various obstacle limitation surfaces (OLSs) to be determined, which vary according to the aerodrome reference code (ARC) of a given aerodrome (Figure 4). An OLS is an imaginary surface in the air which an object may not penetrate unless otherwise motivated through a detailed Aeronautical Study, approved by the SACAA. OLSs vary in size, slope, and extent according to the ICAO Aerodrome Reference Code (ARC) of the affected aerodrome, which is based on runway length and aircraft wingspan, referenced to standard atmospheric conditions at sea level (Figure 5). Appendix 7.10 contains further details of the ICAO Annex 14 standards applicable to various ARCs under different infrastructural and operational conditions.

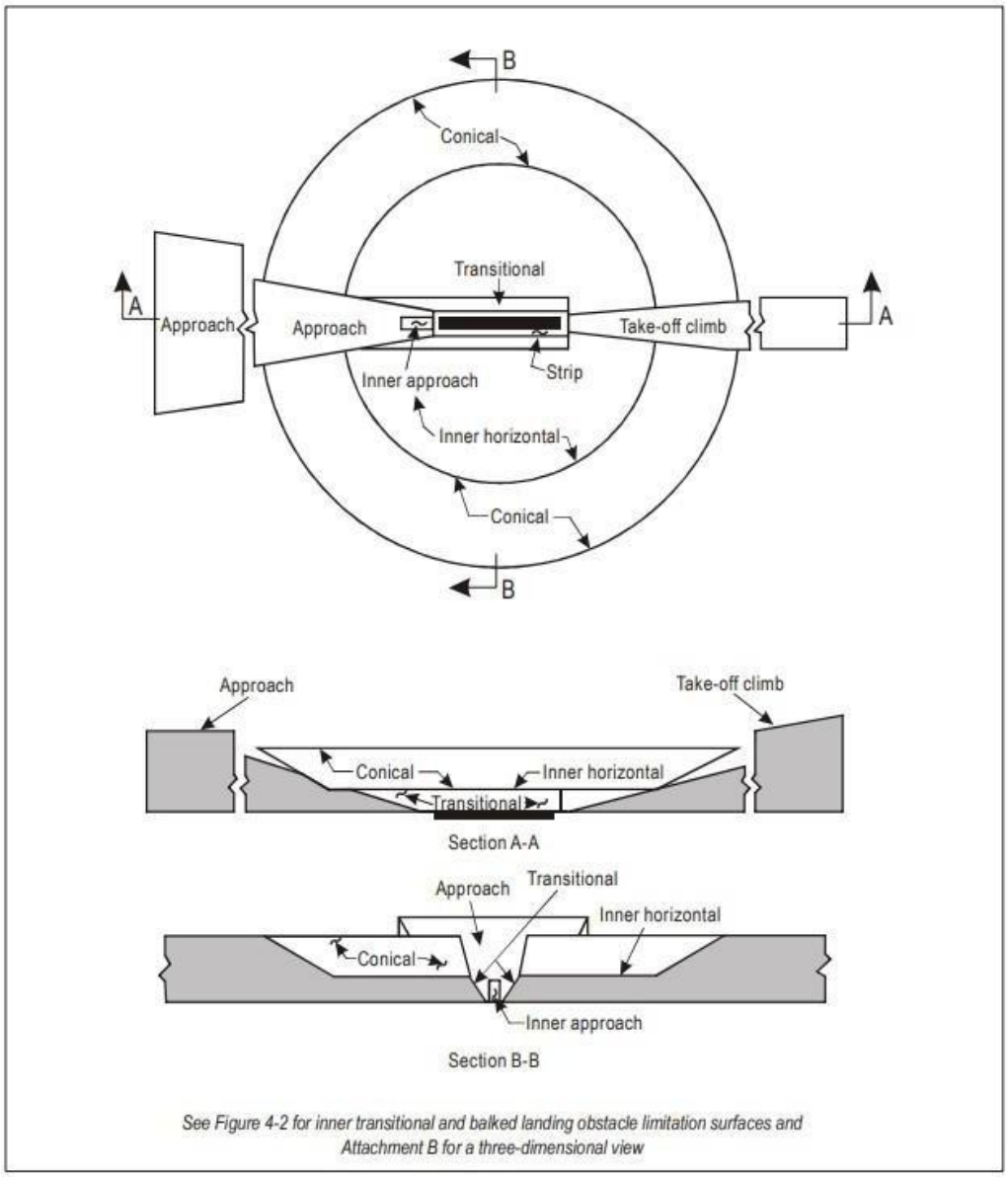


Figure 4: ICAO Obstacle Limitation Surfaces

Table 1-1. Aerodrome reference code
(see 1.6.2 to 1.6.4)

Code element 1	
Code number	Aeroplane reference field length
1	Less than 800 m
2	800 m up to but not including 1 200 m
3	1 200 m up to but not including 1 800 m
4	1 800 m and over
Code element 2	
Code letter	Wingspan
A	Up to but not including 15 m
B	15 m up to but not including 24 m
C	24 m up to but not including 36 m
D	36 m up to but not including 52 m
E	52 m up to but not including 65 m
F	65 m up to but not including 80 m

Note 1.— Guidance on planning for aeroplanes with wingspans greater than 80 m is given in the Aerodrome Design Manual *(Doc 9157), Parts 1 and 2.*

Note 2.— Procedures on conducting an aerodrome compatibility study to accommodate aeroplanes with folding wing tips spanning two code letters are given in the PANS-Aerodromes (Doc 9981). Further guidance can be found in the manufacturer's manual on aircraft characteristics for airport planning.

Figure 5: ICAO Aerodrome Reference Codes (ARC)

5.1.1 Aerodrome Classification

There are no aerodromes within 15km of either of the proposed deviations and therefore no impact on any obstacle limitation surfaces.

5.1.2 Obstacle Risk Assessment

Appendix 7.3 contains SACAA guidelines for assessment of risk, based on (a) the severity of risk associated with an event and (b) the likely consequence. In this case, the most severe event would be a departing aircraft impacting an obstacle (transmission line or supporting pylon). The assessment compares a 'with the development' against a 'without the development' scenario, although it must be noted that transmission lines already exist substantially on the proposed alignment, with no incidents reported historically. Table 1 illustrates probability ratings based on the likelihood of occurrence of an event, and Table 2 illustrates the allocation of risk based on a combination of probability and severity.

Table 1: Risk Probability Assessment

PROBABILITY ASSIGNMENT	LIKELIHOOD OF OCCURRENCE
5	Frequent- Likely to occur many times
4	Occasional - Likely to occur sometimes
3	Remote - Unlikely to occur, but possible
2	Improbable - Very unlikely to occur (not known to have occurred)
1	Extremely Improbable - Almost inconceivable

Table 2: Risk Assessment Matrix

RISK PROBABILITY		RISK SEVERITY				
		Catastrophic A	**Hazardous B**	**Major C**	**Minor D**	**Negligible E**
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely Improbable	1	1A	1B	1C	1D	1E

Based on the tables and additional guidance from Appendix 7.3, obstacle related risk of OLS penetrations has been classified as '1A', which is considered acceptable. Operational risk mitigation in terms of SA-CATS 139.30 may include the control and marking (including illumination) of construction equipment, transmission lines, pylons and other obstacles and the issue of Aeronautical Information Circulars (AICs) or NOTAMs. For aircraft such as crop-sprayers operating under special authorisations near the transmission line, standard operating procedures (PANS/OPS) already provide for risk mitigation in the event of aircraft emergencies, especially for operations under Part 91 of the SACARS. It should be emphasised, however, that these mitigations are more of an operational nature than environmental, and the environmental impact of the proposed deviation on civil aviation activities is considered low.

Table 3: Risk Tolerability Matrix

TOLERABILITY LEVEL	ASSESSED RISK INDEX	SUGGESTED CRITERIA
Intolerable	5A, 5B, 5C, 4A, 4B, 3A	Unacceptable in the existing circumstances
Tolerable	5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C	Acceptable based on risk mitigation – may require a Management decision
Acceptable	3E, 2D, 2E, 1A, 1B, 1C, 1D, 1E	Acceptable

5.2 Airspace Analysis, Radar and Communications Assessment

The Screening Tool identified no sensitivities relating to airspace apart from the proximity of the Magalies-Orient glider area, in respect of which there is a SACAA advisory from flight levels 110-145. In practice, this only applies 1808m above ground level along the route of the 14km deviation.

In general, the SACAA AIP/AD provisions on uncontrolled airspace are:

- The rules of the air (RSA AIP 1.1-1) are that no aircraft shall be flown over built-up areas at a height less than 1000ft (305m) above the highest obstacle, within a radius of 2 000ft (610m) from the aircraft. When flown elsewhere, no aircraft shall be flown at a height less than 500 ft (152m) above the ground or water, unless flight can be made without hazard or nuisance to persons or property on the ground.

- The rule of 500ft applies to aircraft overflying the proposed transmission line beyond 15km from any aerodrome. Once the transmission line is in place, the 500ft rule (above the highest obstacle i.e., the critical pylon) will remain applicable, with no impact on aviation safety.

- The closest ground-based navigational equipment is beyond 35km away from the line.

- SACAA CAR Part 171.03.3, PROTECTION OF RADIO SITES reads:
  "(ix) VHF / UHF Receivers / Transmitters
  Ground-level safeguarding of a circle radius of 91 metres centred on the base of the main aerial tower (or equivalent structure). Additionally, from an elevation of 9 metres on this circle, a 2% (1:50) slope out to a radius of 610 metres."

- Reference has also been made to Eskom Guidelines on servitude width, and the impact of the EM effects of powerlines. Doc 240-170000623 (controlled disclosure but available from Eskom).

Based on all the above, the impact of the development on nearby civilian radar and EM installations is considered low and risk is assessed as '1D', which is deemed 'Acceptable'.

6 Conclusions & Recommendations

1. Ground-based infrastructure of the proposed deviations are compliant with all relevant ICAO Annex 14 and SACAA (SACARS and SA-CATS) standards with respect to obstacle limitation surfaces and can therefore be supported for purposes of environmental approval.

2. The proposed deviations will not materially impact civilian radar, navigation, or communications infrastructure in the environs, nor present any material new risks.

3. The conclusion of this CASSV is that the environmental sensitivity status of the proposed project remains 'low'.

4. Should an Environmental Authorisation be granted and the project proceeds to construction, all new obstacles must comply with the height limits specified and the SACAA Obstacle Approval process per CA139.27 and associated SA-CATS complied with.

5. Operational mitigation measures arising from any abnormal conditions or special operations identified in consultation with the SACAA during construction will need to be implemented and such conditions appropriately recorded in the Aeronautical information Publication (AIP), Aeronautical Information Circulars (AIC) and/or Notices to Airmen (NOTAMs) from time to time.

7 Appendices

7.1 Glossary of Aviation Related Terms

The definitions listed below apply to this document.

TERM	ACRONYM	DEFINITION
Aeronautical Flight Information Systems	AFIS	Wind, weather and other operational information available to aircraft operators at airfields that do not have fully-fledged control tower facilities
Aircraft Classification Rating	ACR	An indication of runway strength requirements of aircraft, which must not exceed the corresponding Pavement Classification Rating (PCR) of the airfield
Aeronautical Information Publication	AIP	A document published and regularly updated by the SA Civil Aviation Authority containing key details and parameters of licensed aerodromes, in accordance with the SA Civil Aviation Regulations.
Aeronautical Information Circular	AIC	A document 'for information only' issued by the SA Civil Aviation Authority containing basic details of aerodromes (usually) registered with the SACAA but not licensed.
Air Traffic Control	ATC	Air traffic control is a system of ground-based services that manages the safe and efficient movement of aircraft within controlled airspace and on the ground at airports. The primary objectives of air traffic control are to prevent collisions between aircraft, provide a safe and orderly flow of air traffic, and ensure efficient utilization of airspace and airport resources.
Air Traffic and Navigational Services SOC Limited	ATNS	A State-owned Enterprise formed in 1993, responsible for overall air traffic and airspace management in South Africa.
Airfield Ground Lighting	AGL	Lighting systems on runway, taxiways, and apron.
Above Mean Sea Level	AMSL	The vertical measurement of an aircraft's altitude or the elevation of a location with reference to the average sea level. It serves as a standard reference point for altitude calculations, providing a consistent baseline for navigation and airspace management.
Civil Aviation Regulations	SACARS	A national aviation authority or civil aviation authority is a government statutory authority in each country that maintains an aircraft register and oversees the approval and regulation of civil aviation.
Civil Aviation Technical Standards	SA-CATS	A set of technical standards and industry best practices to be read in conjunction with the CARS.
Distance Measuring Equipment	DME	Electronic distance measuring capability of VHF radio antennae.

Flexible Use of Airspace	FUA	A policy of the SACAA in terms of which airspace is not unnecessarily restricted, allowing more effective use as long as safety standards are not compromised.
General Aviation	GA	Private, recreational, pilot training, and non-scheduled commercial air services
Global Navigational Satellite System	GNSS	Satellite based aircraft navigational systems relying on GPS technology
Integrated Development Plan	IDP	An Integrated Development Plan is a plan for an area that provides an overall framework for development. It aims to coordinate the work of local and other spheres of government in a coherent plan to improve the quality of life for all the people living in an area.
International Civil Aviation Organisation	ICAO	The International Civil Aviation Organization is a specialized agency of the United Nations. It changes the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth.
International Air Transport Association	IATA	The International Air Transport Association is a trade association of the world's airlines. Consisting of 290 airlines, primarily major carriers, representing 117 countries, the IATA's member airlines account for carrying approximately 82% of total available seat miles air traffic.
Instrument Meteorological Conditions	IMC	Weather conditions under which visual operation of aircraft is impossible due to industry visibility limits not being met, which require aircraft to be operated using instrument procedures.
Level of Service	LOS	Level of service to passengers as defined in IATA reference documents
Obstacle Limitation Surfaces	OLS	A set of imaginary planes or surfaces above the ground that sets limits beyond which ground-based objects may not penetrate, to preserve the operational safety of aircraft, as laid down in ICAO reference material, particularly Annex 14.
Passengers	PAX	Number of passengers
Performance Based Navigation	PBN	ICAO recommended policy to improve air traffic management through increased reliance on satellite-based navigation systems and thereby reduce aircraft-based carbon footprint through reduction in approach and 'hold' times of arriving aircraft.
South African Civil Aviation Authority	SACAA	The South African Civil Aviation Authority is the South African national aviation authority, overseeing civil aviation and governing investigations of aviation accidents and incidents.
Safety Health, and Environment	SHE	Safety Health and Environment
Service Level Agreement	SLA	A service-level agreement (SLA) is a commitment between a service provider and a client. The most common component of an SLA is that the services should be provided to the customer as agreed upon in the contract.

TERM	ACRONYM	DEFINITION
Request for Information	RFI	A request for information is a common business process whose purpose is to collect written information about the capabilities of various suppliers. Normally it follows a format that can be used for comparative purposes. An RFI is primarily used to gather information to help make a decision on what steps to take next.
Request for Proposal	RFP	A request for proposal is a document that solicits proposal, often made through a bidding process, by an agency or company interested in procurement of a commodity, service, or valuable asset, to potential suppliers to submit business proposals.
Remote Navigation	RNAV	Satellite based navigation systems similar to GNSS
Runway	RWY	According to the International Civil Aviation Organization, a runway is a "defined rectangular area on a land airport prepared for the landing and take-off of aircraft."
Standards and Recommended Practices	SARPS	A set of industry norms, published by ICAO and other recognised industry bodies, that determine best-practice processes and procedures as distinguished from strict regulatory requirements.
Threshold	THD	The defined end of a runway is marked in accordance with ICAO SARPS.
Visual Flight Rules	VFR	Visual flight rules are a set of regulations under which a pilot operates an aircraft in weather conditions generally clear enough to allow the pilot to see where the aircraft is going.
Very high-frequency omnidirectional radio antenna	VFOR	Radio antenna that provides position and directional vectoring capability to aircraft. NDB is a non-directional radio beacon.
Visual Meteorological Conditions	VMC	Meteorological conditions under which visual sight distances (per SACAA rules) allow flight operations to proceed under VFR without the necessity of resorting to instrument procedures.
Work Breakdown Structure	WBS	In project management and systems engineering, a work breakdown structure is a deliverable-oriented breakdown of a project into smaller components. It is a key project deliverable that organizes the team's work into manageable sections.

7.2 26th Amendment – CATS 139.01.30

139.01.30

(1) A holder of an aerodrome licence shall monitor a concerned aerodrome and its surroundings to assess permanent or temporary obstacle limitation and penetration surfaces, to establish if any obstacle has an impact on the safety of aircraft operations at such aerodrome.

(2) If an assessment referred to in subregulation (1) identifies any obstacle that negatively impacts on aircraft safety, a holder of an aerodrome licence shall take appropriate action to mitigate the risk and restrict or remove such obstacle.

(3) A holder of an aerodrome licence shall not erect or allow to be erected, without the prior approval of the Director, a building, structure, or object which projects above a slope of 1 in 20 and which is within 3 000 m measured from the nearest point on a boundary of such aerodrome or heliport.

(4) An object, whether temporary or permanent, which projects above the obstacle limitation surfaces within a radius of 8 km as measured from an aerodrome reference point shall be marked as prescribed in Document SA-CATS 139.

(5) An object, whether temporary or permanent, which projects above the obstacle limitation surfaces beyond a radius of 8 km and constitutes a potential hazard to aircraft, shall be marked as prescribed in Document SA-CATS 139.

(6) A holder of an aerodrome licence shall not erect or allow to be erected, without the prior approval of the Director, a building or object which constitutes an obstruction or potential hazard to an aircraft operating in a navigable airspace in the vicinity of an aerodrome, or navigation aid, or which will adversely affect the performance of a radio navigation or ILS.

(7) A holder of an aerodrome licence shall not erect or allow to be erected, without the prior approval of the Director, an object higher than 45 m above the

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mean level of a landing area or within 8 km measured from the nearest point on a boundary of an aerodrome.

(8) A holder of an aerodrome licence shall not erect or allow to be erected, without the prior approval of the Director a building, structure, or object which projects above a slope of 1 in 20 and which is within 3 000 m measured from the nearest point on a boundary of an aerodrome or heliport.

(9) A holder of an aerodrome licence shall not erect or allow to be erected, without the prior approval of the Director, a building, structure or other object which will project above the obstacle limitation surfaces of an aerodrome or heliport.

(10) A person or authority involved in land development, shall not compromise air safety by authorising or developing any land or erecting a building or obstacle on such land.";

(d) the insertion in Subpart 2 in the arrangements of regulations of the following Subpart:

"SUBPART 2: LICENSING AND OPERATION OF AERODROMES

139.02.1 Requirements for licence

139.02.2 Application for licence or amendment thereof

139.02.3 Processing of application for licence or amendment thereof

139.02.4 Adjudication of application for licence or amendment thereof

139.02.5 **[[Issuing]** Issuance of licence

139.02.6 Period of validity

139.02.7 Transferability

139.02.8 Renewal of licence

139.02.9 Licence of intent

139.02.10 Aerodrome design requirements

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31st Amendment of February 2025

"139.01.1 (1) This Part applies to—
(a) certification of an aerodrome and heliport used for international and domestic operations;
(b) licensing of an aerodrome and heliport open to public use;
(c) approval of Type A, B and C aerodromes;
(d) approval of a helistop;
(e) registration of an unlicensed aerodrome;
(f) aerodrome survey; and
(g) approval of an obstacle assessment organisation.".

(c) the substitution in regulation 139.01.1 for sub-regulation (2) of the following sub-regulation:
(2) [No place in the Republic] There shall be no aerodrome or heliport in the Republic used as a place of landing or departure by an [aeroplane with a MCM exceeding 5 700 kilograms, used in] aircraft, to conduct commercial air transport operations, unless [it] such an aerodrome or heliport has been certified, licensed or approved in terms of this Part [the regulations in this part].

7.3 SACAA Technical Guidance Material: Aeronautical Studies

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

TECHNICAL GUIDANCE MATERIAL

for Conducting Aeronautical Studies or Risk Assessment Advisory Circular

SUBJECT: GUIDANCE ON CODUCTING AERONAUTICAL STUDIES OR RISK ASSESSMENT

EFFECTIVE DATE: 11 JANUARY 2022

APPLICABILITY

An Aeronautical study or risk assessment may be carried out when aerodrome standards cannot be met as a result of development. Such a study is most frequently undertaken during the planning of a new airport or during the certification of an existing aerodrome.

PURPOSE

An aeronautical study is conducted to assess the impact of deviations from the aerodrome standards specified in Volume Ito Annex 14 to the Convention on International Civil Aviation, SACAR 139 and Part 11, to present alternative means of ensuring the safety of aircraft operations, to estimate the effectiveness of each alternative and to recommend procedures to compensate for the deviation.

1. REFERENCE:

i. ICAO Annex 14 – Volume 1
ii. ICAO Doc 9774 -Manual on Certification of Aerodromes
iii. ICAO Doc 9734 - Safety Oversight Manual
iv. ICAO Doc 9859 -Safety Management Manual
v. Civil Aviation Regulation Part 11- Subpart 4 Procedure for granting of Exemptions and Recognition of Alternative means of Compliance
vi. Civil Aviation Regulation Part 139 -Aerodromes and Heliports
vii. Civil Aviation Regulation Part 140 -Safety Management

2. TERMS AND ABBREVIATIONS:

TERM	DEFINITION
Risk mitigation	The process of incorporating defences or preventive controls to lower the severity and/or likelihood of a hazard's projected consequence.
Safety risk -	The predicted probability and severity of the consequences or outcomes of a hazard.

ABBREVIATION	DESCRIPTION

ATS	Air Traffic Services
CAR	Civil Aviation Regulation
DCA	Director of Civil Aviation
GA	General Aviation
ICAO	International Civil Aviation Authority
SACAA	South African Civil Aviation Authority
SACAR	South African Civil Aviation Regulation
M: ADO	Manager: Aerodrome Operations
E: AI	Executive: Aviation Infrastructure
SM: ADFA	Senior Manager: Aerodromes and Facilities

3. TECHNICAL ANALYSIS

3.1 Technical analysis will provide justification for a deviation on the grounds that an equivalent level of safety can be attained by other means. It is generally applicable in situations where the cost of correcting a problem that violates a standard is excessive but where the unsafe effects of the problem can be overcome by some procedural means which offers both practical and reasonable solutions.

3.2 In conducting a technical analysis, inspectors will draw upon their practical experience and specialised knowledge or consult other specialists in relevant areas.

3.3 When considering alternative procedures in the deviation approval process, it is essential to bear in mind the safety objective of the CAR 139 and the applicable standards so that the intent of the regulations is not circumvented.

4. APPROVAL OF DEVIATIONS

4.1 In some instances, the only reasonable means of providing an equivalent level of safety is to adopt suitable procedures and to require, as a condition of certification, that cautionary advice be published in the appropriate AIS publications.

4.2 The determination to require caution will be primarily dependent on two considerations:

4.2.1 A pilot's need to be made aware of potentially hazardous conditions; and

4.2.2 The responsibility of the DCA to publish deviations from standards that would otherwise be assumed under certificate status.

5. AERONAUTICAL STUDY

5.1 An aeronautical study is a tool used to review aerodrome and airspace processes and procedures to ensure that safety criteria in place are appropriate. The study can be undertaken in a variety of ways using various analytical methods appropriate to the aeronautical study requirements. An aeronautical study should include the use of:

5.1.1 current state review (baseline position)

5.1.2 quantifiable data analysis

5.1.3 stakeholder interviews

5.1.4 safety/risk matrix

5.2 In general, an aeronautical study should be viewed as providing an overarching document giving a holistic view of an aerodrome's operational environment e.g., the macro perspective as compared to a safety case study which is a task specific document e.g., the micro view.

5.3 An aeronautical study may contain many elements; however, risk assessment, risk mitigation and risk elimination are key components.

5.4 An aeronautical study can be undertaken at any time. It is constructed to consider all relevant factors, including traffic volume, mix and distribution, weather, aerodrome role, aerodrome and airspace configuration, surface activity and the efficiency requirements of operators using the service. The scope of studies can range from

minor adjustments to aerodrome configuration, e.g., from the widening of a taxiway to a complete review of aerodrome airspace with the introduction of a new runway.

5.5 The scope of an aeronautical study usually reflects one of three situations:

5.5.1 the existing operation, e.g., the aerodrome, airspace or ATS (or sometimes just a particular part of the operation);

5.5.2 a change to the existing operation;

5.5.3 a new operation.

5.6 Where the aeronautical study is used to consider a change to existing operations or a new operation, it may not initially be possible to provide all the safety assessment and evidence required. An aeronautical study can identify and evaluate aerodrome service options, including service increases or decreases or the introduction or termination of services (such as the introduction of a rapid exit taxiway or removal of a grass runway).

5.7 The goal of risk management in an aeronautical study is to identify risks and take appropriate action to minimise risk as much as is reasonably practicable. Decisions made in respect of risks must balance the technical aspects of risk with the social and moral considerations that often accompany such issues.

5.8 These decisions may have significant impact on an aerodrome's operation and for an effective outcome there should be a level of consensus as to their acceptability among the key stakeholders.

5.9 Aerodrome operators should also undertake aeronautical studies when the aerodrome operating environment changes. These changes are normally precipitated by a trigger event such as a change, or a proposed change in; airspace design, aircraft operations, aerodrome infrastructure or the provision of an air traffic service.

5.10 It is the aeronautical study process that determines the site-specific need for services, and identifies and recommends a course of action, or presents options for decision makers to act upon. In all cases the aeronautical study should document and demonstrate the site-specific need and rationale for the level of service, procedure design or operational requirements.

6. TRIGGER FACTORS

6.1 The aeronautical study is a tool for the aerodrome management to use as part of its operations and strategic planning and is an integral part of the aerodrome's Safety Management Systems.

6.2 One of the purposes of the aeronautical study is to determine levels of operational safety, service or procedures that should apply at a particular location. The decision to undertake this type of study may be triggered by any one or more of a wide range of factors.

6.3 These may include changes to:

6.3.1 The number of movements;

6.3.2 the peak traffic periods;

6.3.3 the ratio of IFR to VFR traffic;

6.3.4 the type of operations - scheduled, General Aviation (GA), training, etc.;

6.3.5 the types, and variety of types, of aircraft using the aerodrome (jet, turboprop, rotary, etc.);

6.3.6 aerodrome layout;

6.3.7 aerodrome management structure;

6.3.8 runway or taxiway and associated manoeuvring areas;

6.3.9 operations of a neighbouring aerodrome or adjacent airspace.

6.4 Feedback about any changes should be sought from aviation stakeholders including pilots, individuals, and other representative groups as part of the study.

6.5 An aeronautical study may be initiated by an aerodrome operator, or another interested party, such as an air traffic service provider or air operators.

7. THE CONCEPT OF RISK

7.1 Risk Management is a key area in an aeronautical study. ICAO Doc 9859: Safety Management Manual defines risk as following:

7.1.1 **Risk mitigation** - The process of incorporating defences or preventive controls to lower the severity and/or likelihood of a hazard's projected consequence.

7.1.2 **Safety risk** - The predicted probability and **severity** of the consequences or outcomes of a hazard.

8. SAFETY RISK

Safety risk management is also a key component of safety management system and aeronautical study. The term safety risk management is meant to differentiate this function from the management of financial risk, legal risk, economic risk and so forth. This section presents the fundamentals of safety risk and includes the following topics:

A. Definition of Safety Risk;
B. Safety Risk Probability;
C. Safety Risk Severity;
D. Safety Risk Tolerability; and
E. Safety Risk Management.

8.1 Definition of Safety risk:

Safety risk is the projected likelihood and severity of the consequence or outcome from an existing hazard or situation. While the outcome may be an accident, an "intermediate unsafe event/consequence" may be identified as "the most credible outcome".

8.2 Safety Risk Probability: (How likely is it that it will occur?)

The process of controlling safety risks starts by assessing the probability that the consequences of hazards will materialize during aviation activities performed by the organization. Safety risk probability is defined as the likelihood or frequency that a safety consequence or outcome might occur. The determination of likelihood can be aided by questions such as:

8.2.1 Is there a history of occurrences similar to the one under consideration, or is this an isolated occurrence?
8.2.2 What other equipment or components of the same type might have similar defects?
8.2.3 How many personnel are following, or are subject to, the procedures in question?
8.2.4 What percentage of the time is the suspect equipment or the questionable procedure in use?
8.2.5 To what extent are there organizational, managerial or regulatory implications that might reflect larger threats to public safety?

Any factors underlying these questions will help in assessing the likelihood that a hazard may exist, taking into consideration all potentially valid scenarios. The determination of likelihood can then be used to assist in determining safety risk probability. The table below presents a typical safety risk probability table, in this case, a five-point table. The table includes five categories to denote the probability related to an unsafe event or condition, the description of each category, and an assignment of a value to each category.

LIKELIHOOD	MEANING	VALUE
Frequent	Likely to occur many times (has occurred frequently)	5
Occasional	Likely to occur sometimes (has occurred frequently)	4
Remote	Unlikely to occur, but possible (has occurred rarely)	3
Improbable	Very unlikely to occur (not known to have occurred)	2
Extremely Improbable	Almost inconceivable that the event will occur	1

Table1: Safety Risk Probability

8.3 Safety Risk Severity

Once the probability assessment has been completed, the next step is to assess the safety risk severity, taking into account the potential consequences related to the hazard. Safety risk severity is defined as the extent of harm that might reasonably occur as a consequence or outcome of the identified hazard. The severity assessment can be based upon:

8.3.1 **Fatalities/injury:** - How many lives may be lost (employees, passengers, bystanders, and the general public)?

8.3.2 **Damage:** - What is the likely extent of aircraft, property or equipment damage?

The severity assessment should consider all possible consequences related to an unsafe condition or object, taking into account the worst foreseeable situation. Table 2 presents a typical safety risk severity table. It includes five categories to denote the level of severity, the description of each category, and the assignment of a value to each category. As with the safety risk probability table, this table is an example only.

SEVERITY	MEANING	VALUE
CATASTROPHIC	• Equipment destroyed • Multiple deaths	A
HAZARDOUS	• A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their task accurately or completely. • Serious injury • Major equipment damage	B
MAJOR	• A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of increase in workload, or as a result of conditions impairing their efficiency. • Serious incident • Injury to persons	C
MINOR	• Nuisance • Operating limitations • Use of emergency procedures • Minor incident	D
NEGLIGIBLE	• Little consequences	E

Table 2: Safety Risk Severity

8.4 Risk assessment

Risks are the potential adverse consequences of a hazard and are assessed in terms of their severity and probability. Thus, for each hazard resulting from the non-compliance, one can now describe the risk by placing the combination of severity and probability in the Risk assessment matrix table shown below. If the risk comes out as medium or above, risk reduction measures must be identified.

RISK PROBABILITY		RISK SEVERITY				
		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely improbable	1	1A	1B	1C	1D	1E

Table 3: Risk Assessment Matrix Table

As can be seen from the risk classification matrix, risk reduction measures can aim towards either reducing the likelihood of an occurrence or reducing the probability of an occurrence.

The first priority should always be to seek measures that will reduce the likelihood of an occurrence (i.e. accident prevention). When contemplating mitigating measures, it is always necessary to look to the intent of the requirement that is not (fully) complied with.

8.5 Risk mitigation strategies may include:

8.5.1 revision of the system design;

8.5.2 modification of operational procedures;

8.5.3 changes to staffing arrangements;

8.5.4 training of personnel to deal with the hazard;

8.5.5 development of emergency and/or contingency arrangements and plans;

8.5.6 ultimately, ceasing operation.

8.6 Safety Risk Tolerability

The safety risk probability and severity assessment process can be used to derive a safety risk index. The index created through the methodology described above consists of an alphanumeric designator, indicating the combined results of the probability and severity assessments. The respective severity/probability combinations are presented in the safety risk assessment matrix in table 3.

The third step in the process is to determine safety risk tolerability. First, it is necessary to obtain the indices in the safety risk assessment matrix. For example, consider a situation where a safety risk probability has been assessed as occasional (4), and safety risk severity has been assessed as hazardous (B). The composite of probability and severity (4B) is the safety risk index of the consequence.

The index obtained from the safety risk assessment matrix must then be exported to a safety risk tolerability matrix (Table 4) that describes the tolerability criteria for the particular organization. Using the example above, the criterion for safety risk assessed as 4B falls in the "unacceptable under the existing circumstances" category. In this case, the safety risk index of the consequence is unacceptable.

8.6.1 The organization must therefore:

a) Take measures to reduce the organization's exposure to the particular risk, i.e., reduce the likelihood component of the risk index;

b) Take measures to reduce the severity of consequences related to the hazard, i.e., reduce the severity component of the risk index; or

c) Cancel the operation if mitigation is not possible.

TOLERABILITY DESCRIPTION	ASSESSED RISK INDEX	SUGGESTED CRITERIA
[redacted]	5A, 5B, 5C 4A, 4B, 3A	Unacceptable in the existing circumstances.
Tolerable	5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C	Acceptable based on risk mitigation. It may require Management decision.
Acceptable	3E, 2D, 2E, 1B, 1C, 1D, 1E	Acceptable

Table 4: Safety Risk Tolerability Matrix

8.7 Example of an Aeronautical Study Methodology

A generic model of an Aeronautical Study methodology consists of initiation, preliminary analysis, risk estimation, risk evaluation, risk control and action or monitoring.

8.7.1 **STEP 1:** Initiation

This step consists of defining the opportunity or problem and the associated risk issues; setting up the risk management team; and beginning to identify potential users who may be affected by any change.

8.7.2 **STEP 2:** Preliminary Analysis

The second step consists of defining the basic dimensions of the risk problem and undertaking an initial identification, analysis and evaluation of potential risks. This preliminary evaluation will help determine:

a) whether a situation exists that requires immediate action;
b) whether the matter requires further study prior to any action being taken; or,
c) whether the analysis should be ended as the risk problem is determined not to be an issue.

8.7.3 **STEP 3 and 4:** Risk Estimation

These steps estimate the degree of risk. Step 3 estimates the severity of the consequences and step 4 estimates the probability of their occurrence.

8.7.4 **STEP 5:** Risk Evaluation

The benefits and operational costs of the activity are integrated into the analysis and the risk is evaluated in terms of the safety implications of the activity and of the needs, issues, and concerns of affected users.

8.7.5 **STEP 6**: Risk Control

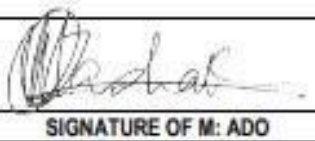
This step identifies feasible risk controls and mitigations which will act to reduce either the probability of the event or the consequence of the event should it occur.

8.7.6 **STEP 7:** Action or Monitoring

This step entails implementing the chosen risk control options, evaluating the effectiveness of the risk management decision process, and implementing an on-going monitoring program.

9. Acceptance by the SACAA

The Aeronautical Study and Risk assessment results need to be submitted to SACAA for the granting of exemptions.

DEVELOPED BY:		
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SIGNATURE OF M: ADO	NAME IN BLOCK LETTERS	DATE
REVIEWED & VALIDATED BY:		
	NELSON NKABITI	11 JANUARY 2021
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APPROVED BY:		
	GAWIE BESTBIER	11 JANUARY 2021
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END

7.4 ICAO Annex 14: Table 4-1

Table 4-1. Dimensions and slopes of obstacle limitation surfaces — Approach runways

APPROACH RUNWAYS

Surface and dimensions[a] (1)	RUNWAY CLASSIFICATION: Non-instrument Code number 1 (2)	Non-instrument Code number 2 (3)	Non-instrument Code number 3 (4)	Non-instrument Code number 4 (5)	Non-precision approach Code number 1,2 (6)	Non-precision approach Code number 3 (7)	Non-precision approach Code number 4 (8)	Precision approach category I Code number 1,2 (9)	Precision approach category I Code number 3,4 (10)	Precision approach category II or III Code number 3,4 (11)
CONICAL										
Slope	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Height	35 m	55 m	75 m	100 m	60 m	75 m	100 m	60 m	100 m	100 m
INNER HORIZONTAL										
Height	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m
Radius	2 000 m	2 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 m
INNER APPROACH										
Width	—	—	—	—	—	—	—	90 m	120 m[e]	120 m[e]
Distance from threshold	—	—	—	—	—	—	—	60 m	60 m	60 m
Length	—	—	—	—	—	—	—	900 m	900 m	900 m
Slope								2.5%	2%	2%
APPROACH										
Length of inner edge	60 m	80 m	150 m	150 m	140 m	280 m	280 m	140 m	280 m	280 m
Distance from threshold	30 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m
Divergence (each side)	10%	10%	10%	10%	15%	15%	15%	15%	15%	15%
First section										
Length	1 600 m	2 500 m	3 000 m	3 000 m	2 500 m	3 000 m	3 000 m	3 000 m	3 000 m	3 000 m
Slope	5%	4%	3.33%	2.5%	3.33%	2%	2%	2.5%	2%	2%
Second section										
Length	—	—	—	—	—	3 600 m[b]	3 600 m[b]	12 000 m	3 600 m[b]	3 600 m[b]
Slope	—	—	—	—	—	2.5%	2.5%	3%	2.5%	2.5%
Horizontal section										
Length	—	—	—	—	—	8 400 m[b]	8 400 m[b]	—	8 400 m[b]	8 400 m[b]
Total length	—	—	—	—	—	15 000 m	15 000 m	15 000 m	15 000 m	15 000 m
TRANSITIONAL										
Slope	20%	20%	14.3%	14.3%	20%	14.3%	14.3%	14.3%	14.3%	14.3%
INNER TRANSITIONAL										
Slope	—	—	—	—	—	—	—	40%	33.3%	33.3%
BALKED LANDING SURFACE										
Length of inner edge	—	—	—	—	—	—	—	90 m	120 m[e]	120 m[e]
Distance from threshold	—	—	—	—	—	—	—	c	1 800 m[d]	1 800 m[d]
Divergence (each side)	—	—	—	—	—	—	—	10%	10%	10%
Slope	—	—	—	—	—	—	—	4%	3.33%	3.33%

a. All dimensions are measured horizontally unless specified otherwise.
b. Variable length (see 4.2.9 or 4.2.17).
c. Distance to the end of strip.
d. Or end of runway whichever is less.
e. Where the code letter is F (Table 1-1), the width is increased to 140 m except for those aerodromes that accommodate a code letter F aeroplane equipped with digital avionics that provide steering commands to maintain an established track during the go-around manoeuvre.

Note.— See Circulars 301 and 345, and Chapter 4 of the PANS-Aerodromes, Part 1 (Doc 9981) for further information.

7.5 ICAO Annex 14: Table 4-2

Table 4-2. Dimensions and slopes of obstacle limitation surfaces

RUNWAYS MEANT FOR TAKE-OFF

Surface and dimensions[a] (1)	Code number 1 (2)	2 (3)	3 or 4 (4)
TAKE-OFF CLIMB			
Length of inner edge	60 m	80 m	180 m
Distance from runway end[b]	30 m	60 m	60 m
Divergence (each side)	10%	10%	12.5%
Final width	380 m	580 m	1 200 m 1 800 m[c]
Length	1 600 m	2 500 m	15 000 m
Slope	5%	4%	2%[d]

a. All dimensions are measured horizontally unless specified otherwise.
b. The take-off climb surface starts at the end of the clearway if the clearway length exceeds the specified distance.
c. 1 800 m when the intended track includes changes of heading greater than 15° for operations conducted in IMC, VMC by night.
d. See 4.2.24 and 4.2.26.

7.6 DFFE Protocol 320

Published in Government Notice **No. 320** GOVERNMENT GAZETTE **43110** 20 MARCH 2020
GAZETTED FOR IMPLEMENTATION

CIVIL AVIATION

PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON CIVIL AVIATION INSTALLATIONS

1. SCOPE

This protocol provides the criteria for the specialist assessment and minimum report content requirements for impacts on civil aviation installations for activities requiring environmental authorisation. This protocol replaces the requirements of Appendix 6 of the Environmental Impact Assessment Regulations[1].

The assessment and reporting requirements of this protocol are associated with the level of sensitivity identified by the national web based environmental screening tool (screening tool).

The screening tool can be accessed at: https://screening.environment.gov.za/screeningtool.

2. SITE SENSITIVITY VERIFICATION AND MINIMUM REPORT CONTENT REQUIREMENTS

Prior to commencing with a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration as identified by the screening tool must be confirmed by undertaking a **site sensitivity verification**.

2.1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or specialist with expertise in radar.

2.2. The site sensitivity verification must be undertaken through the use of:
- (a) a desk top analysis, using satellite imagery;
- (b) a preliminary on-site inspection; and
- (c) any other available and relevant information.

2.3. The outcome of the site sensitivity verification must be recorded in the form of a report that:
- (a) confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool, such as new developments or infrastructure etc.;
- (b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
- (c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

3. SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

TABLE 1: ASSESSMENT AND REPORTING OF IMPACTS ON CIVIL AVIATION INSTALLATIONS
1. General Information
1.1. An applicant intending to undertake an activity identified in the scope of this protocol for which a specialist assessment has been identified on the screening tool: 1.1.1. on a site identified as being of:

1.1.1.1. "very high", "high" or "medium" sensitivity for civil aviation, must submit a **Civil Aviation Compliance Statement;** or

1.1.1.2. "low" sensitivity, no further assessment requirements are identified.

1.1.2. on a site where the information gathered from the site sensitivity verification differs from the designation of "very high", "high" or "medium" sensitivity on the screening tool and it is found to be of a "low" sensitivity, no further assessment requirements are identified;

1.1.3. similarly, on a site where the information gathered from the initial site sensitivity verification differs from the designation of "low" sensitivity on the screening tool and it is found to be of a "very high", "high" or "medium" sensitivity, a **Civil Aviation Compliance Statement** must be submitted; and

1.1.4. If any part of the proposed development footprint falls within an area of "very high", "high" or "medium" sensitivity, the assessment and reporting requirements prescribed for the "very high", "high" and "medium" sensitivity apply to the entire footprint. In the context of this protocol, development footprint means the area on which the proposed development will take place and includes any area that will be disturbed.

VERY HIGH SENSITIVITY RATING - high likelihood for significant negative impacts on the civil aviation installation that cannot be mitigated. In-depth assessment of the potential impacts are likely to be required before development can be considered in these areas.

HIGH SENSITIVITY RATING – potential for negative impacts on the civil aviation installation that can potentially be mitigated. Further assessment may be required to investigate potential impacts and mitigation measures.

MEDIUM SENSITIVITY RATING - low potential for negative impacts on the civil aviation installation, and if there are impacts there is a high likelihood of mitigation. Further assessment of the potential impacts may not be required.

2. Civil Aviation Compliance Statement

2.1. The compliance statement must be prepared by an environmental assessment practitioner or a specialist with expertise in radar.

2.2. The compliance statement must:

2.2.1. be applicable to the preferred site and the proposed development footprint;

2.2.2. confirm the sensitivity rating for the site; and

2.2.3. indicate whether or not the proposed development will have an unacceptable impact on civil aviation installations.

2.3. The compliance statement must contain, as a minimum, the following information:

2.3.1. contact details of the environmental assessment practitioner or the specialist, their relevant qualifications and expertise in preparing the statement, and a curriculum vitae;

2.3.2. a signed statement of independence by the environmental assessment practitioner or specialist;

2.3.3. a map showing the proposed development footprint (including supporting infrastructure) overlaid on the civil aviation sensitivity map generated by the screening tool;

2.3.4. a comment, in writing, from the South African Civil Aviation Authority (SACAA), which may include inputs from the Obstacle Evaluation Committee (OEC), if appropriate, confirming no unacceptable impact on civil aviation installations; and

2.3.5. should the comment from the SACAA indicate the need for further assessment, a copy of the assessment report and mitigation measures is to be attached to the compliance statement and incorporated into the Basic Assessment Report or Environmental Impact Assessment Report with mitigation and monitoring measures identified included in the EMPr. The assessment must be in accordance with the requirements stipulated by the SACAA.

	2.4. A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.
LOW SENSITIVITY RATING - No significant impacts on the civil aviation installation are expected in low sensitivity areas. It is unlikely for further assessment and mitigation measures to be required.	No requirement identified.

7.7 Resumes of Key Resources

Mr Basil Karstadt – PrCPM, BTech (SACPCMP). Basil is a professional project and construction manager who has specialized for nearly 30 years in the delivery of infrastructure projects, mainly for Public Sector clients in remote and developing areas. In aviation, from 2013 he led the KZN Provincial Treasury 'Crack Team' that was responsible for Provincial intervention in the municipal airport space and drove the KZN Regional Airport strategy, which ensured appropriate expenditure on upgraded infrastructure at many of KZN's municipal airports.

Mr Jon Heeger – Pr Eng, MBA, BSc (Eng). Formerly a property development manager in the RMB Group and Group Development Manager at ACSA from 1996, Jon has since become widely recognized as a leading 'regional airport' expert, specializing in turnaround strategies for former Municipal and GA airports. He also regularly acts as Guest Lecturer for the University of KZN and is active in the seminar and conference space as a host and moderator on a wide variety of airport development strategies and aviation topics.

Mr Sibusiso Nkabinde – PD (SA), Dip (BA), Air Traffic Control. Sibusiso is a seasoned professional with over 23 years' experience in Air traffic Management, including Aeronautical Information Management, Aerodrome and Approach Air Traffic Control, Air Traffic Control Instruction & Examination, Air Traffic Services Management, Executive Leadership in Aeronautical Search & Rescue, Aerospace Medicine (ATC Ergonomics) and Governance. He is a full Professional Member of the Director's Association of South Africa and has notably represented South Africa in CANSO Task Teams, ICAO meetings, and South Atlantic ATM/CNS forums, focusing on Air Traffic Management System harmonization and interoperability.

Also refer: www.gwi.co.za | www.av-innovate.com

Curriculum Vitae (CV): JBC Heeger

1	PROPOSED POSITION FOR THIS PROJECT	*Aviation and Airport Specialist*
2	NAME OF PERSON	*Heeger, Jon*
3	DATE OF BIRTH	*2 May 1955*
4	NATIONALITY	*South African*
5	MEMBERSHIP IN PROFESSIONAL SOCIETIES	*Member, Engineering Council of South Africa -ECSA No. 820365 (1982 - 2008)*
6	EDUCATION	*MBA (Construction Management), University of the Witwatersrand, 1985* *GDE (Construction Management), University of the Witwatersrand, 1985*
		BSc. Civil Engineering, University of the Witwatersrand, 1977 *BCom modules (part time): Micro and Transport Economics, UNISA 1978-1980*
7	OTHER TRAINING	*ACSA/IATA/ICAO- Internal Training & Development programmes (1994-2000)* *Presentor/Attendee at various Aviation Conferences/Seminars (Aviadev, ATNS, BARSA)* *Guest Lecturer for Aerotropolis Institute Africa, UKZN (202-2023)*
8	LANGUAGES & DEGREE OF PROFICIENCY	Language / Speaking / Reading / Writing *English / Excellent / Excellent / Excellent* *Afrikaans / Good / Excellent / Good*
9	COUNTRIES OF WORK EXPERIENCE	South Africa, Botswana, Ghana, Mozambique, Nigeria, Liberia, China, Kenya, Brazil and Rwanda.
10	EMPLOYMENT RECORD	
	Independent Expert/Consultant: Airport Planning and development	FROM: *2000* / TO: *2022*
	Airport Planning/Development Division - Airports Company South Africa Position: Group Manager – Airport developments	FROM: *1996* / TO: *1999*
	RMB Group (now Eris Properties) Position: General Manager: Developments	FROM: *1984* / TO: *1996*

	SA Transport Services Position: Civil Engineer – Rail Infrastructure	FROM: *1977*	TO: *1983*
11	WORK UNDERTAKEN THAT BEST ILLUSTRATES YOUR CAPABILITY TO HANDLE THIS ASSIGNMENT		
		2022/3 Airport/Aviation Specialist (ongoing) *Feasibility Study for a possible freight Aerotropolis in Sedibeng Municipality.* Passenger and freight demand assessment and catchment area determination; engagement with airline/charter operators and freight forwarders. Status quo review of existing airport infrastructure and compliance check with ICAO Annex 14, IATA and SACAA SARP's (safety, security, health and safety).	

		Assessment of non-aeronautical revenue opportunities. Surface connectivity assessment and pre-planning for improved access onto Provincial roads system, based on Provincial Master Plans and IDP's. Identification of gaps and opportunities for innovation in airlift development, particularly RPAS (Remote Piloted Aircraft Systems, UAV's or drones) in commercial and law enforcement operations. Reference: Mr Tebogo Mutlaneng, Project Manager, Vaal Aerotropolis Study, Sedibeng District Municipality – **tebogom@sedibeng.gov.za**

		2022/3 Airport/Aviation Specialist (ongoing) *Master and Land-use plan Review and Pre-Feasibility Study for the re-development of Plettenberg Bay Airport, Bitou Local Municipality.* Route analysis and passenger demand assessment; engagement with airline/GA operators. Status quo review of airport infrastructure and compliance check with ICAO Annex 14, IATA and SACAA SARP's (safety, security, health and safety). Diversification strategy for non-aeronautical revenue development. Surface connectivity assessment and pre-planning for new airport entrance and improved access onto Provincial roads system, including e-hailing options. Identification of gaps and opportunities for innovation in airlift development, particularly RPAS (Remote Piloted Aircraft Systems, UAV's or drones) in maritime patrol, commercial and law enforcement operations. Reference: Mr M Memani, Municipal Manager, Bitou Local Municipality – **mmemani@plett.gov.za**
		2022 Airport/Aviation Specialist (ongoing) *Master and Land-use plan Review and Pre-Feasibility Study for the re-development of Margate Airport, Ray Nkonyeni Local Municipality.* Route analysis and freight/passenger demand assessment; engagement with airline/charter

		operators. Status quo review of airport infrastructure and compliance check with ICAO Annex 14, IATA and SACAA SARP's (safety, security, health and safety). Diversification strategy for non-aeronautical revenue development. Multi-modal connectivity assessment and pre-planning for new airport entrance and improved access onto Provincial road system, including public transport options. Identification of gaps and opportunities for innovation in airlift development, particularly RPAS (Remote Piloted Aircraft Systems, UAV's or drones) in maritime patrol and law enforcement operations. Reference: Ms Volanda van Rensburg, Airport Manager, Margate Airport, Ray Nkonyeni Local Municipality – **yolanda.vanrensburg@rnm.gov.za**
		2022 Aviation Specialist (ongoing) *Benchmarkinig Study and Strategy Development for Airlift as a Catalyst for Tourism Growth and Development in the SADC region. (SADC Ministers Council, Secretariat)* Route analysis and passenger surveys, route/frequency assessment with airline/charter operators. Assessment of scheduled and non-scheduled fleet mix and status quo review of airport infrastructure within the SADC region and compliance with ICAO Annex 14, IATA and client service levels standards/policies (security, health and safety). Review of Bilateral Air Service Agreements for International and Regional movements within SADC, identification of gaps and opportunities for innovation in airlift development. Status assessment of the progress of the SAATM initiative through the African Civil Aviation Commission and assessment of the status of the Yammousoukro Protocol. Reference: Dr Salifou Siddo, AFC Agriculture and Finance Consultants GmbH – **salifou.siddo@afci.de**

		2019/2022 Airport Specialist *Redevelopment Options for Delta 2000 Airport, Delta 2000 (Anglo American, SMEC Engineers)* Passenger surveys, traffic forecasting and route/frequency assessment with airline/charter operators. Assessment and agreement of critical design aircraft, runway and terminal planning to ICAO Annex 14, IATA and client service levels standards/policies (security, health and safety) for three site options; commercial land use options for airport precinct, Airport Master Plan including assessment of growth potential for aeronautical and commercial revenues. Assessment of airspace class and options development for navigational and ATC protocols. Input into EIA and noise footprint; Feasibility Study for integrated airport precinct and site options analysis. Reference: Mr B Strauss (Kumba) – 082 904 9300 **abraham.strauss@angloamerican.com**
		2019/2020: Airport Specialist *Pre-Feasibility Study for Proposed Ghana Airports Company Limited Regional Airport, Takoradi, Ghana.* Airport catchment area determination, traffic forecasting and route/frequency assessment. Engagement with GACL on Airport Master Plan and critical aircraft determination. Data gathering including meteorological/wind, runway length calculations and specification, obstacle limitation surface assessment, assessment of land use options for airport precinct, Airport Master plan including assessment of growth potential for aeronautical and JIT freight revenues. Terminal planning including peak hour assessment. Feasibility Study for integrated airport precinct.
		Airport Specialist and Business Analyst *Revitalization Options for Ulundi Airport, South Africa. Zululand District Municipality. (2017)* Land use options for airport precinct, update of the Airport Master plan including traffic analysis and

		assessment of growth potential for aeronautical and freight revenues. Feasibility Study for integrated airport precinct. Reference: Ms Thembi Hadebe - 082 902 6029
		Commercial/Airport Specialist *Precinct Planning of Port Elizabeth and East London Airports, ACSA (2018/2020)* Advise on commercial land use options for airport precinct, assessment of current traffic in relation to previous forecasts insofar as this may impact on commercial and cargo potential/growth. Assessment of other exogenous developments that may impact growth at both airports (e.g. Coega and ELIDZ). Reference: Mr L Tilana (ACSA)
		Airport Specialist and Business Analyst *Redevelopment Options for Grand Central Airport, Midrand. Ivora Capital, Old Mutual Properties (2018/9)* Land use options for airport precinct, update of the Airport Master plan including traffic analysis and assessment of growth potential for aeronautical and non-aeronautical revenues. Pre-Feasibility Study for integrated airport precinct and potential for use of drones for fast-moving commodity/freight delivery. Reference: Mr C Duminy - 083 633 6909
		Aviation Specialist *Republic of Kenya National Tourism Strategy (2017)* Analysis of existing route networks and traffic distribution and associated potential for international and domestic traffic/freight. Alignment of tourism priorities with airport and airlift strategies as between Ministry of Tourism, KAA, KCAA and stakeholder airlines including Kenya Airways, Fly540, Kenya Express and many non-scheduled operators. Assessment of likely impact of early adoption of SAATM on traffic within Kenya. Ref: Hon Najib Balala, Cabinet Secretary, Tourism

		Airport Specialist and Business Analyst (SMEC) *Richards Bay Airport Master Plan, South Africa. City of uMhlathuze (Richards Bay). (2009, 2017, 2021)* Site assessment, land use options and Airport Master plan including traffic forecast, critical aircraft determination and assessment of growth potential for aeronautical, freight and non-aeronautical revenues. Pre-Feasibility Study for new airport. Reference: Ms B Strachan – **strachanb@umhlathuze.gov.za**
		Airport Specialist and Business Analyst *Redevelopment Options for PC Pelser Airport, Klerksdorp. Matlosana Municipality (2011,2017-19)* Land use options for airport precinct, update of the Airport Master plan including traffic analysis and assessment of growth potential for aeronautical and non-aeronautical revenues. Pre-Feasibility Study for integrated airport precinct. Reference: Mr A Khutlhwayo - 062 692 0590
		Aviation/Airport Specialist and Business Analyst *KZN Treasury Crack Team. KZN Treasury. (2012 – 2013).* Airport Master planning including traffic forecasts and assessment of growth potential for aeronautical and non-aeronautical revenues; Pietermaritzburg, Margate, Wonderboom National, Ladysmith, Ulundi and Richards Bay Airports. Reference: Mr F Alberts, ED Director, Wonderboom National Municipality – 082 802 0382
		Airport Specialist and Business Analyst *Proposed New Mkuze Airport. Umhlosinga Development Agency. (2008 to 2013).* Feasibility study for the Mkuze Regional Airport as a catalyst for socio-economic upliftment of the

		Umkhanyakude District, including potential for local airfreight of agricultural produce.
		Business/Aviation Specialist *Maun Airport Expansion. Botswana Civil Aviation Authority. (2005-2010).* Preparation and validation of traffic forecasts, developing a business model, scenario planning and economic cost-benefit analysis for period 2005-2030. Development of new terminal concept designs and detailed landside Master planning including parking areas and non-scheduled operator FBOs
		Consultant Team Leader *Development of new Passenger Terminals and Cargo Facilities at Maputo. Aeroporto du Mozambique. (2007-2012).* Design review and construction supervision consultant for the new Domestic and International Terminals at Maputo International Airport. Review of contractor-produced traffic forecast, design brief and design proposals, level-of-service analysis and value management. Reference: Mr A Tuendue, CEO, ADM
		Summary of other airport assignments pre 2007. (1980-2007). • *Team leader – Kruger Free State International Airport:* Commercialisation Study Proposal. • *Lead Joint Venture partner - Mafikeng Airport IDZ (NW Provincial Government):* Proposed Minerals Cluster and commercial development. • *Team leader – Ghana Civil Aviation Authority*: Accra and Kumasi International airport Master Plans; air platform and non-aeronautical commercialisation (proposal). • *Joint Venture consultant – Ghana Civil Aviation Authority:* Implementation of parking equipment

		and systems, Kotoka International Airport, Accra, Ghana. • *Transport Economist/Business Analyst – World Bank - Monrovia, Liberia:* Assessment of emergency works required at Roberts International Airport. Validation of traffic forecast, development of business model, scenario planning and economic cost-benefit analysis. • *Team Leader – Department of Civil Aviation, Gaborone, Botswana:* Design review and development of alternate designs for new passenger terminal, including development and validation of traffic forecasts and preparation of facilities/ architectural design brief. • *Aviation Specialist – Bi Courtney Consortium, Lagos, Nigeria: Preparation of Master Plan proposals for expansion of domestic terminal* ***As Client Development Team Leader*** • *International Terminal Retail Project – ORTIA Johannesburg (1997)* • *Design Team Leader – Domestic terminal ORTIA (1997)* • *4 300 bay Multi-storey parkade, ORTIA (1996)* • *Chairman, Airport Steering Committee, La Mercy Airport (1997)* • *General Aviation Centre, East London (1998)* • *Terminal upgrades, East London & Port Elizabeth (1998)* • *Refrigerated cargo facility, Cape Town (1997)* • *Precious Commodities handling facility, JIA (1997)* • *In-flight catering facility, Cape Town (1997)*

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



Date: 06/03/2026

[Signature of staff member or authorized representative of the staff]

Day/Month/Year

Full name of authorized representative: JONATHAN BARRY CLIVE HEEGER

1	PROPOSED POSITION FOR THIS PROJECT	*Air Traffic Management Specialist*
2	NAME OF PERSON	*Nkabinde, Sibusiso*
3	DATE OF BIRTH	*1 July 1981*
4	NATIONALITY	*South African*
5	MEMBERSHIP IN PROFESSIONAL SOCIETIES	*Professional Member, Director's Association of South Africa. No 2303/18. 2023 to current*
6	EDUCATION	*MBA, University of Witwatersrand, 2020 - current* *Diploma (Business Administration), Management College of South Africa, 2014* *Cert (Executive Management), University of La Verne, 2022*
7	OTHER TRAINING	*Introduction to Safety Management Systems for ATNS Operational Personnel, 2021* *Approach Control (Procedural and Radar) Rating, SACAA, 2012* *Approach Control (Procedural) Rating, SACAA, 2007* *Aerodrome Control Rating, SACAA, 2004* *PBN Implementation, ICAO, 2013* *Presenter/Attendee at various Aviation Conferences/Seminars/Committees (ATNS, ACSA, SACAA, CANSO, ICAO, AFRAA, SASAR, OPSCOM, CARCOM)*

		Guest Lecturer on ATC Ergonomics in Aerospace Medicine, SACAA (2018 - current)			
8	LANGUAGES & DEGREE OF PROFICIENCY	Language	Speaking	Reading	Writing
		English	*Excellent*	*Excellent*	*Excellent*
		Afrikaans	*Fair*	*Fair*	*Fair*
		Zulu	*Good*	*Good*	*Fair*
9	COUNTRIES OF WORK EXPERIENCE	South Africa			
10	EMPLOYMENT RECORD				

	Manager: Air Traffic Services – OR Tambo International Airport, ATNS	FROM: *2016*	TO: *2023*
	Head: Aeronautical Search and Rescue, South African Search and Rescue Organization (DoT)	FROM: *2016*	TO: *2019*
	Manager Air Traffic Services – King Shaka International Airport, ATNS	FROM: *2012*	TO: *2016*
	Air Traffic Controller, ATNS	FROM: *2005*	TO: *2012*
11	WORK UNDERTAKEN THAT BEST ILLUSTRATES YOUR CAPABILITY TO HANDLE THIS ASSIGNMENT		
		2020/3 Project Manager *Air Traffic Management Operational Performance Dashboard at OR Tambo Air traffic Services Unit.* Dashboard Development: Lead the design, development, and implementation of an Air Traffic Management Operational Performance Dashboard for OR Tambo Air Traffic Services Unit. Collaborate with stakeholders to define key performance indicators (KPIs) and metrics for operational, safety, and administrative aspects of air traffic services. Data Integration: Integrate data from various sources to create a unified and real-time view of operational performance. Ensure seamless integration of metrics related to safety, efficiency, and administrative processes for comprehensive reporting.	

		Metrics Analysis: Analyse performance metrics to identify trends, areas for improvement, and opportunities for optimization. Provide actionable insights to enhance operational efficiency, safety protocols, and administrative procedures. Management Reporting: Develop regular and ad-hoc reports for management, presenting key findings and performance metrics. Collaborate with leadership to communicate complex data in a clear and concise manner. Quality Assurance: Implement quality assurance processes to validate data accuracy and reliability within the Operational Performance Dashboard. Conduct regular audits to ensure the integrity of the performance metrics. Stakeholder Collaboration: Collaborate with air traffic controllers, safety officers, and administrative staff to gather relevant data and insights. Engage with management to understand their reporting needs and provide tailored solutions. Reference: Josia Manyakoana, COO - ATNS **josiam@atns.co.za**
		2012/233 Manager: Air Traffic Services *Air Traffic Service Unit Approval of Obstacles in Controlled Airspace* Obstacle Assessment: assessment of each obstacle applied for in terms of its height, location, and potential impact on air traffic operations, considering factors such as the obstacle's proximity to flight paths, airports, and navigation aids. Safety Standards and Regulations: Ensuring that the proposed obstacles comply with safety standards and regulations set by the aviation authorities including adherence to height restrictions, lighting requirements, and other safety measures aimed at preventing collisions. Risk Mitigation Strategies: Development and implementation of ATM strategies to mitigate risks posed by any existing obstacles.

		Documentation and Approval Process: Documenting the obstacle assessment process, including details of each obstacle, the corresponding risk assessment, and any mitigation strategies employed. Monitoring and Compliance: Following approvals, ensuring that implemented measures are consistently maintained, including the identification of any changes in the airspace environment that impacts on the Obstacle limitations. Communication with Air Traffic Controllers: Communicating obstacles to air traffic controllers, ensuring that they have up-to-date information about the controlled airspace. Reference: Josia Manyakoana, COO - ATNS **josiam@atns.co.za**
		2005/12 Air Traffic Controller *Aerodrome, Approach Procedural and Approach Radar Air Traffic Control.*

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



ate: 14/10/2025

[Signature of staff member or authorized representative of the staff]

Day/Month/Year

Full name of authorized representative: SIBUSISO WELCOME NKABINDE

7.8 FAA Guidelines on EM Interference

For proposed projects off, but close to airport property, the methodology considers three key questions:

Does the project height penetrate airspace?

The FAA has certain criteria to determine this, but in the SA scenario we substitute ICAO Annex 14 and any additional provisions of the SACAA Regulations (CATS 139.30), where these are more onerous. This would typically involve a desktop analysis of the aerodrome or airfields closest to the project site. Airfields further than 8km away are generally not affected, unless approach or departure corridors pass directly over the site and there are precision navigation approaches in play, where aircraft have very 'flat' approach paths of 2,0%. (There might be military considerations here, too, but these in fact are excluded from the provisions of the DFFE Protocol).

Is the Project Design/Orientation likely to cause reflectivity concerns?

For solar PV projects consideration is given to 'glint' and 'glare' issues that might cause 'flash blindness' arising from both specular and diffused reflections. This is important for solar PV projects, but for the other proposed facilities it may be necessary to consider any potential effects of construction materials (roof) and other potentially reflective components.
Depending on the proposed site layout, a geometric analysis based on the changing azimuth and bearing of the sun through the year, at key times during the day where air traffic is likely to be impacted, is sufficient for this purpose.

Is the Project likely to Interfere with Communications Systems, Operations and/or Flight Standards/Procedures?

The DFFE Protocol for environmental civil aviation studies refers specifically to 'radar'; however the FAA precedent document also looks at potential interference on all types of communications equipment, which is prudent. Thus, consideration is given to, inter alia:
Location of radar facilities Location of Control Tower(s)
Location of (remaining) ground based NDB's (since these are being phased out)
Location of VOR/DME installations that could be affected by the potential of the project (or key components thereof) to generate EM radiation that could perhaps affect these. Based on FAA guidelines, these distances are generally quite small, and are not usually a cause for concern.
Finally, as part of the 'operational' aspect, a review would be undertaken of existing flight corridors, RNAV and VFR routes, approaches in the area and published airport/airfield procedures, circuits, etc., to assess the potential of the proposed project to negatively impact on any of these at a material risk level i.e. more severe than 'low'. If so - and only in such case – would the matter need to be escalated to the SACAA for further analysis or review, in terms of the DFFE Protocol.

7.9 NEMA Listed Activities

Refer to the Scoping Report prepared by Vhubvo.

7.10 ICAO Standards and Recommended Practices (SARPS)

All infrastructure proposals and developments will be implemented in accordance with standards and recommended practices of the International Civil Aviation Organisation (ICAO) and the SA Civil Aviation Authority (SACAA), as contained in the Civil Aviation Regulations (CARS), as well as relevant SANS standards, planning policies and by-laws.

Other stakeholders in the civil aviation space may need be consulted including the SACAA and ATNS.

Airport geometrics are determined in accordance with International Standards and Recommended practices (SARPS). These standards are included in the following documents (as updated by ICAO from time to time):

Relevant ICAO Annexes

Annex 14	Airport Planning
Annex 10	Aeronautical communications
Annex 17	Security
Doc 8991	Manual on Air Traffic Forecasting
Doc 8261	Airport Economics Manual

- ICAO, Annex 14 "International Standards and Recommended Practices for Airports";
- ICAO, Airport Design Manual part 1: Runways;
- ICAO, Airport Design Manual part 2: Taxiways, Aprons and Holding Bays;
- ICAO, Airport Design Manual part 3: Pavements;
- ICAO, Airport Design Manual part 4: Visual Aids;
- ICAO, Airport Design manual part 5: Electrical Systems;
- ICAO, Airport Design Manual part 6: Frangibility;
- ICAO, Airport Services Manual, part 1: Rescue and Fire Fighting;
- ICAO, Airport Services Manual, part 3: Bird Control and Reduction;
- ICAO, Airport Services Manual, part 6: Control of Obstacles.

Airport Reference Code

ICAO Annex 14 assigns an Airport Reference Code (Code number and letter), which is a simple method for matching the characteristics of airport facilities to those of aircraft intended to operate at the airport. The code number is used to classify the runway length, referenced to sea level under 'standard' atmospheric conditions; the code letter is used to classify the main part of the airside layout, based mainly on aircraft wingspan, although more recent editions also use landing gear geometry as a reference.

CODE ELEMENT 1		CODE ELEMENT 2	
Code Number	**Aeroplane Reference Field Length**	**Code Letter**	**Wing span**
1	Less than 800	**A**	Up to but not including 15m
2	800m up to but not including 1200m	**B**	15m up to but not including 24m
3	1200m up to but not including 1800m	**C**	24m up to but not including 36m
4	1800m and over	**D**	36m up to but not including 52m
		E	52m up to but not including 65m
		F	65m up to but not including 80m